

REPAIR INSTRUCTION NO. RI-1078-97/1

1 Aircraft affected

G 115E / EG all as affected

2 Subject

ATA-Code: 57-00 Wings

Repair of aileron and flap bellcrank attachment points

3 Introduction

This Repair Instruction provides the instructions to accomplish the final repair for the aileron and flap bell crank attachment points as defined in MSB1078-205/3 and later revisions.

[Revision 1 to provide additional information.](#)

4 Concurrent Documents

Document No.	Rev. / Date	Title
115E AMM, Issue 2	Rev 8 or later	Grob G 115E Aircraft Maintenance Manual
1T-115E-4, Issue 2	Rev 0 or later	Grob G 115E Aircraft Illustrated Part Catalogue
1TG115EG-02-00GV-00-1	7 or later	Grob G 115EG Aircraft General Vehicle Manual
1TG115EG-3-00-00-1	7 or later	Grob G 115EG Structure Repair Manual
1TG115EG-5-08JG-00-1	3 or later	Grob G 115EG Aircraft Weight and Balance Manual
1TG115EG-4-00-00-1	8 or later	Grob G 115EG Aircraft Illustrated Parts Breakdown
MSB1078-205	Rev 3	Special Inspection Control Surface Hinge Bracket Attachment

5 Approval Note

The technical content of this document is approved under the authority of the DOA ref. EASA.21J.030.

The associated repair design is approved under the authority of the DOA ref. EASA.21J.030.

6 Limitations

N/A

7 Repair / Instructions

Note: The following instructions describe the repair for a single attachment point. The principal repair procedure is applicable for all 4 attachment points. If a single attachment point is treated differently, it is stated in the instructions. **The definition and location of the access holes is recommended by Grob only and must not be obeyed.**

Note: Each chapter and sub-chapter in the following instruction defines the curing process for a specific attachment point. If several locations are repaired at once these curing steps can be combined for the whole repair and must not be followed separately. The repair shall be cured at room temperature for at least 12hrs (GS510020-12) or 6 hrs (GS510020-13) before starting the initial cure. That will prevent the resin from dripping off the repair area. If that is secured, the curing time at room temperature can be adjusted. Make sure to follow the curing cycle i.a.w. AMM Chapter 51-20 for the respective resin system. Nevertheless, the inner and outer repair can be post cured together, if the required temperature at the inner repair can also be reached.

Note: In case of additional findings, which are not covered in the following instructions or when in doubt, please contact Grob.

Note: The AMM references in the following instructions are for the G 115E. For G 115EG use the relevant Job Guide.

7.1 Repair of Aileron bellcrank attachment in wing

- 7.1.1 Make the aircraft safe for parking, refer to AMM Chapter 10-10.
- 7.1.2 Gain access to the aileron bellcrank attachment bolts
 - 7.1.2.1 Remove the aileron bellcrank access panel under the wing.
 - 7.1.2.2 Remove the control rods from the aileron bellcrank, refer to AMM Chapter 27-00.
 - 7.1.2.3 Remove the bellcrank and attaching brackets from the aircraft. Discard the self-locking nuts.
- 7.1.3 Cut an access hole into the wing surface as small as practical, refer to Figure 1.

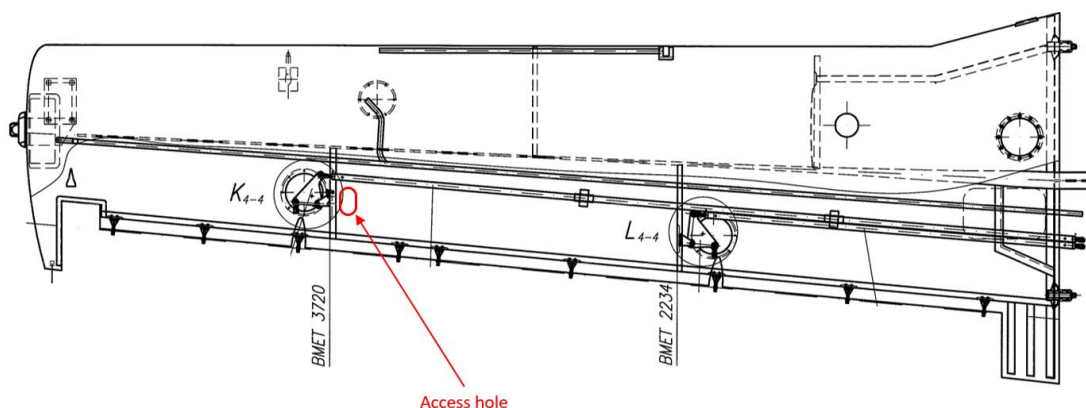


Figure 1: Access Hole Wing, Aileron bell crank attachment bolts (LH shown, RH mirrored)

G 115E / EG

Grob Aircraft SE, Lettenbachstrasse 9, 86874 Tussenhausen-Mattsies

- 7.1.4 Remove the hinge bracket bolts and washers at the attachment point. Discard the bolts and washers.
- 7.1.5 Carefully grind away the remaining resin and/or two part structural adhesive holding the bolt heads in position.
- 7.1.6 Carefully sand the repair area for the overlap repair.
- 7.1.7 If required, remove the damaged fiber layers and plywood material around the bolt holes with a piloted counterbore, refer to Figure 2.

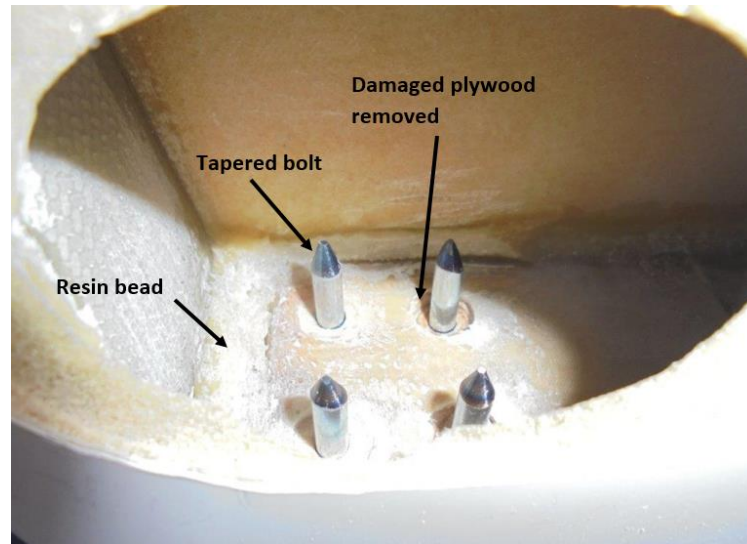


Figure 2: Insert damage removed and tapered bolts installed (principle image)

- 7.1.8 Remove the grinding dust with a vacuum cleaner.
- 7.1.9 Install four tapered bolts through the holes in the rib. Wax the tapered bolts with release agent e.g. QZ5111 before installation. The tapered end must point outboard, refer to Figure 2. Verify that the repair plate (item 2 of Table 1) fits in the repair area properly. If required, trim the repair plate to fit, especially at the edge of the control rod hole.
- 7.1.10 If required, fill-out the holes where the damaged insert material was removed with thickened resin. Use GS510020-13 with 15-20% cotton flocks GS510060 and 2-3% Aerosil GS510063.
- 7.1.11 Remove the part number label from the respective repair plate.
- 7.1.12 Apply thickened resin to the repair plate and to bonding area, refer to Figure 3.

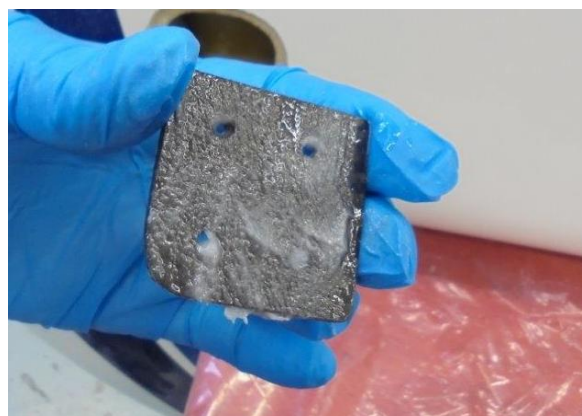


Figure 3: Thickened resin applied to CFRP repair plate

- 7.1.13 Bond the repair plate with the non-chamfered side through the tapered bolts on top of the repair. If required, smoothen out the excessive resin at the edges of the repair plate to gain a transition to the spar.
- 7.1.14 Cover the insert with two layers of carbon fabric GS510040 $\pm 45^\circ$.
- 7.1.15 Remove the tapered bolts.
- 7.1.16 Install four washers (item 4 of List 9) and four bolts (item 1 of List 9), refer to Figure 4. If required, clean the thread of the bolts from resin.



Figure 4: Bolts and washers installed

- 7.1.17 Re-install the removed bell crank brackets to the rib with the previously removed washers and standard M5 nuts. Tighten the nuts by hand just to keep the bolts heads and washers in position. If required, the length of the bolts shall be adjusted by additional washers under the nut.
- 7.1.18 Apply thickened resin around the bolt heads and washers and cover the repair with two layers of glass fabric GS510031 $\pm 45^\circ$, refer to Figure 5.



Figure 5: Thickened resin around bolt heads and washers with covering layers of glass fabric

- 7.1.19 Close the access hole

- 7.1.20 Let the repair cure at room temperature for at least 12hrs (GS510020-12) or 6 hrs (GS510020-13); then perform the 1st stage of the post-curing cycle for 8hrs at 60°C according to AMM Chapter 51-20.
- 7.1.21 Do the final stage of the post curing-cycle at 80°C, refer to AMM Chapter 51-20.
- 7.1.22 Paint the repair area, refer to AMM Chapter 51-20.
- 7.1.23 Replace the four standard M5 nuts with four self-locking nuts item 5 of List 9. Torque the self-locking nuts of the repaired attachment point with 3.6Nm plus safety torque (friction torque or braking torque).
- 7.1.24 Install the aileron bellcrank.
- 7.1.25 Install the aileron control rods, refer to AMM Chapter 27-00.
- 7.1.26 Install the aileron bellcrank access panel.

7.2 Repair of Flap bellcrank attachment in wing

- 7.2.1 Make the aircraft safe for parking, refer to AMM Chapter 10-10.
- 7.2.2 Gain access to the flap bellcrank attachment bolts
 - 7.2.2.1 Remove the flap bellcrank access panel under the wing.
 - 7.2.2.2 Remove the control rods from the flap bellcrank, refer to AMM Chapter 27-00.
 - 7.2.2.3 Remove the flap bellcrank and attaching brackets from the aircraft. Discard the self-locking nuts.
- 7.2.3 Cut an access hole into the wing surface as small as practical, refer to Figure 6.

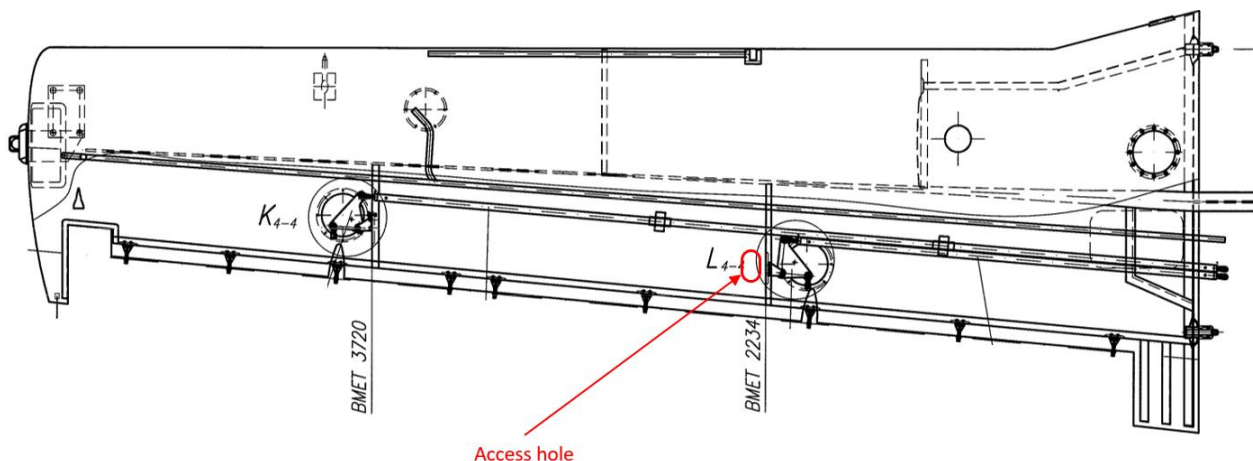


Figure 6: Access Hole Wing, Flap bell crank attachment bolts (LH shown, RH mirrored)

- 7.2.4 Remove the bell crank bracket bolts and washers at the attachment point. Discard the bolts and washers.
- 7.2.5 Carefully grind away the remaining resin and/or two part structural adhesive holding the bolt heads in position.
- 7.2.6 Carefully sand the repair area for the overlap repair.
- 7.2.7 If required, remove the damaged fiber layers and plywood material around the bolt holes with a piloted counterbore, refer to Figure 2.
- 7.2.8 Remove the grinding dust with a vacuum cleaner.
- 7.2.9 Install tapered bolts through the holes in the flap rib. Wax the tapered bolts with release agent e.g. QZ5111 before installation. The tapered end must point inboard, refer to Figure 2. Verify that the repair plate (item 1 of Table 1) fits in the repair area properly. If required, trim the repair plate to fit, especially at the edge of the control rod hole.

- 7.2.10 If required, fill-out the holes where the damaged insert material was removed with thickened resin. Use GS510020-13 with 15-20% cotton flocks GS510060 and 2-3% Aerosil GS510063.
- 7.2.11 Remove the part number label from the respective repair plate.
- 7.2.12 Apply thickened resin to the repair plate and to bonding area, refer to Figure 3.
- 7.2.13 Bond the repair plate with the non-chamfered side through the tapered bolts on top of repair. Smoothen out the excessive resin at the edges of the repair plate to gain a transition/chamfer to the rib.
- 7.2.14 Cover the insert with two layers of carbon fabric GS510040 $\pm 45^\circ$ (stagger the layers).
- 7.2.15 Remove the tapered bolts.
- 7.2.16 Install four washers (item 4 of List 9) and four bolts (item 1 of List 9), refer to Figure 4. If required, clean the thread of the bolts from resin.
- 7.2.17 Re-install the removed bellcrank brackets to the flap rib with the previously removed washers and standard M5 nuts. Tighten the nuts by hand just to keep the bolts heads and washers in position. If required, the length of the bolts shall be adjusted by additional washers under the nut.
- 7.2.18 Apply thickened resin around the bolt heads and washers and cover the repair with two layer of glass fabric GS510031 $\pm 45^\circ$.
- 7.2.19 Let the repair cure at room temperature for at least 12hrs (GS510020-12) or 6 hrs (GS510020-13);
- 7.2.20 Close the access hole
- 7.2.21 Perform the 1st stage of the post-curing cycle for 8hrs at 60°C according to AMM Chapter 51-20.
- 7.2.22 Do the final stage of the post curing-cycle at 80°C, refer to AMM Chapter 51-20.
- 7.2.23 Paint the repair area, refer to AMM Chapter 51-20.
- 7.2.24 Replace the four standard M5 nuts with four self-locking nuts item 5 of List 9. Torque the self-locking nuts of the repaired attachment point with 3.6Nm plus safety torque (friction torque or braking torque).
- 7.2.25 Install the flap bellcrank.
- 7.2.26 Install the flap control rods, refer to AMM Chapter 27-00.
- 7.2.27 Install the flap bellcrank access panel.

8 Weight and CG

Do a weight and balance, refer to AMM Chapter 08-10.

9 Material and Availability

Table 1: Part List

Item	P/N	Description	Qty. per A/C
1	115E-1055.01RI-0	Bolt	8
2	115E-3103.01RI-0	Bolt	8
3	115E-1055.03RI-0	Wing Repair Plate	4
4	DIN9021-A2-5.3	Washer	AR
5	LN9348-05	Self-Locking Nut	16

For further repair material, refer to AMM Chapter 51-30

Table 2: Cross Reference List Fiber Materials

P/N Grob	P/N (Manufacturer)	Description
GS510030	92110 (P-D Interglas Technolgies GmbH); 917 (Porcher Industries)	Glass Fiber Fabric Twill 2/2, 163 g/m ²
GS510031	92125 (P-D Interglas Technolgies GmbH); 3063 (Porcher Industries)	Glass Fiber Fabric Twill 2/2, 280 g/m ²
GS510040*	98141 (P-D Interglas Technolgies GmbH); 3692 (Porcher Industries) 452 (C. Cramer, Weberei, GmbH & Co. KG) KDK 8042 (SGL CARBON GmbH)	Carbon Fiber Fabric Twill 2/2, 204 g/m ²
GS518002	459 (C. Cramer, Weberei, GmbH & Co. KG)	Carbon Fiber Fabric + Alu Mesh for Lightning Protection

***HTA Fiber!**

10 Special Tools

Tapered Bolts

11 Appendices

N/A

12 Accomplishment

The instructions in paragraph 7 have to be accomplished and certified in the logbook by authorized staff:

- in EASA countries according to EASA Part 66
- in non-EASA countries according to national regulations with respect to maintenance.

13 Contact

For questions and assistance or in case of occurrence please contact:

	Product Support,
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